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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/812,846 | 03/30/2004 | Toshihiro Suzuki | 1324.70182 | 3124 |

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| EXAMINER | |
|---|---|
| MAKIYA, DAVID J | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2875 | |

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/812,846 | SUZUKI, TOSHIHIRO | |
| | Examiner | Art Unit | |
| | David J. Makiya | 2875 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-8 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-8 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 30 March 2004 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 7/1/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Figure 7 character 50, Figure 8 character 60, Figure 10 character 70, Figure 11, character 80, and Figure 12 character 90. These reference characters will be assumed to be surface lighting devices for the particular embodiments. In Figure 6, reference character "L" must be disclosed in the specification in addition to on the drawing. In Figure 15, reference characters "L" and "H" will be interpreted as "L1" and "H1." In Figure 25, character 4 is not stated in the specification. The "substrate" found on Page 3, Line 1 will be interpreted as "substrate 4."

The drawings are also objected to because Figures 23-26 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. Because examples 1, 2, and 3 are considered "conventional examples," they require a Prior Art designation. See MPEP § 608.02(g).

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "the diffusion plate 1" for Figures 17, 18, and 20, "reflection plate 2" for Figures 18 and 20, "LED elements 3" for Figures 10, 11, 17, 18, and 20, "the substrate 4" for Figures 14, 17, 18, and 20, and "the prisms 6" for Figures 10 and 11.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any

amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

The disclosure is objected to because of the following informalities: on Page 24, Lines 2-3, "the surface lighting device 100 shown in Fig. 15" should read as "the surface lighting device 100 shown in Fig. 14." Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Chang (US Pub. No. 2002/0159002).

With respect to claim 6, Chang teaches a surface lighting device comprising a surface light source in which light-emitting element groups having three light-emitting elements (34, 36, and 38), which correspond to three primary colors of light (red, green, and blue), arranged to be contiguous with vertexes of a triangle (Figure 3) are arranged in a matrix shape (Figures 7-10), a substrate 26 on which the light-emitting element groups are arranged, and a diffusion plate 28

which is located above the surface light source, wherein the light-emitting element groups are arranged to be deviated every other column or row such that a positional relation among the light-emitting element groups is a delta shape (Figures 7-10), and a row interval, a column interval, and an arrangement angle of the light-emitting element groups are adjusted such that, when it is assumed that an average sum of amounts of light calculated from a sum of amounts of light of the single color light-emitting elements is 100%, a sum of amounts of light of the respective single color light-emitting elements at a center of gravity of the delta shape and a center of gravity of a diamond shape formed by two delta shapes is between 75% and 125% (Paragraph 31).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Kawakami et al. (US Patent 4,628,422).

With respect to claim 1, the applicant's admitted prior art teaches a surface lighting device (Figures 25 and 26) comprising a surface light source in which linear light sources (7, 9, and 17) having light-emitting elements, which corresponds to respective colors among combinations of plural colors at least including three primary colors of light, arranged in series are arranged in a predetermined order, a reflection plate 2 which is laid so as to fill spaces among the light-emitting elements constituting the linear light sources, a substrate 4 on which the

surface light source and the reflection plate are set, and a diffusion plate 1 which is located above the surface light source and the reflection plate wherein non-light-emitting portions of the light emitting elements are covered by the reflection plate (Column 6, Lines 52-53). However, the applicant's admitted art fails to teach the non-light emitting portions of the light emitting elements being covered by the reflection plate. Kawakami et al. teaches three light emitting diodes (200G, 200R, and 200B) whose non-light-emitting portions are covered by the reflection plate 207a. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the surface lighting device with the teachings of Kawakami et al. because using a reflector spreads more light and provides increased luminance.

With respect to claim 2, the applicant's admitted prior art teaches the surface lighting device disclosed above comprising a surface light source in which linear light sources having light-emitting elements, which corresponds to respective colors among combinations of plural colors at least including three primary colors of light, arranged in series are arranged in a predetermined order and at a fixed interval, a first reflection plate 2 which is laid so as to fill spaces among the light-emitting elements constituting the linear light sources, a substrate on which the surface light source, the first reflection plate and the second reflection plate are set and a diffusion plate which is located above the surface light source and the first reflection plate. However, the applicant's admitted art fails to teach a second reflection plate having through-holes in which light-emitting elements can be fit, wherein non-light-emitting portions of light-emitting elements are covered by the second reflection plate. Kawakami et al. teaches a second reflection plate 207a having through-holes (207R, 207G, and 207B) in which light-emitting elements (200G, 200R, and 200B) can be fit, wherein non-light-emitting portions of light-

emitting elements are covered by the second reflection plate (Column 4, Lines 27-29). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the surface lighting device with the teachings of Kawakami et al. because using a reflector spreads more light and provides increased luminance.

With respect to claim 8, the applicant's admitted prior art teaches a liquid crystal display (Figure 25) comprising a surface lighting device and a liquid crystal display panel 13.

Claims 3-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Kawakami et al as applied to claims 1-2 above, and further in view of Myers (US Patent 6,330,111).

With respect to claim 3, the applicant's admitted prior art in view of Kawakami et al. teaches the surface lighting device described above. However, the surface lighting device fails to disclose a substrate, which has linear projected portions, arranged at a fixed interval and on which the surface light source and the reflection plate are set in addition to having an irradiation angle. Myers teaches a lighting element with a substrate which has linear projected portions arranged at a fixed interval (Figure 2A) and on which the surface light source 2 and the reflection plate 3 are set (Column 5, Lines 46-51) and an irradiation angle ($\alpha$,$\beta$) at which an amount of light of the light-emitting elements corresponding to at least one color among the plural colors is maximized according to the interval of the linear projected portions and an interval between the diffusion plate and the substrate, is set according to an angle of slopes or the sides of the linear projected portions (Column 5, Lines 46-51). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the surface lighting device with the teachings of

Myers because the modifications "make individual pixels less visible, as well as expand the viewing angle" (Column 3, Lines 35-36).

With respect to claim 4, the applicant's admitted prior art in view of Kawakami et al. teaches the surface lighting device described above. However, the surface lighting device fails to teach a light irradiation angle correcting means and an irradiation angle. Myers teaches a light irradiation angle correcting means 1 on the light emitting portions of the light-emitting elements, a reflection plate 3 which is laid so as to fill spaces 7 among the light-emitting elements constituting the linear light sources (Figure 2A) and an irradiation angle ($\alpha$,$\beta$), at which an amount of light is maximized, is set by the light irradiation angle correcting means on the light-emitting portion of the linear light sources corresponding to at least one color among the plural colors according to the interval of the linear light sources and an interval between the diffusion plate and the substrate (Column 5, Lines 36-43).

With respect to claim 5, the applicant's admitted prior art in view of Kawakami et al. in further view of Myers teaches the surface lighting device described above. Because the references teach the structure of the claimed surface lighting device, the references would also teach that the interval L, the interval H, and the irradiation angle such that a relation of $L \leq 2*H*\tan$ (irradiation angle at which an amount of light of the linear light sources is maximized) is satisfied.

With respect to claim 7, the applicant's admitted prior art in view of Kawakami et al. teaches the surface lighting device described above. However, the surface lighting device fails to teach a light irradiation angle correcting means and a maximum irradiation angle. Myers teaches a surface lighting device comprising linear light sources (Figure 2A) in which light-emitting

element groups 2 having three light-emitting elements, which correspond to three primary colors of light (Column 3, Lines 22-32), are arranged in series to be contiguous with each other, light irradiation angle correcting means 1 on the light emitting portions of the light-emitting elements, a substrate on which the light-emitting element groups are arranged and a maximum irradiation angle ($\alpha$,$\beta$) of the light-emitting elements is corrected such that a point where a maximum irradiation direction of the light-emitting elements, which is corrected by the light irradiation angle correcting means on the light-emitting portions of the light emitting elements constituting the linear light source of attention, and the diffusion plate cross with each other goes beyond a middle point of the linear light source adjacent to the linear light source of attention (Column 5, Lines 15-18).

***Conclusion***

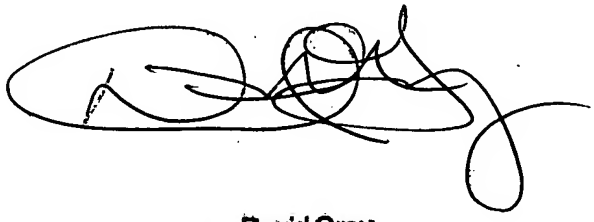
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lin et al. (US Patent 6,856,087) teaches a display device that uses the delta shape of LED light sources. Ewald (US Patent 4,628,422) teaches a display using LED light sources where the non-light-emitting portions are covered by a reflector. Johnson (US Patent 6,608,614) teaches a backlight using light irradiation angle correcting means and a plurality of light sources. Kanatsu et.al. (US Patent 6,867,825) teaches linear light sources where a reflector covers the non-light-emitting portions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Makiya whose telephone number is (571) 272-2273. The examiner can normally be reached on Monday-Friday 7:30am - 4:00pm (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Renee Luebke can be reached on (571) 272-2009. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DJM 09/02/2005



David Gray
Primary Examiner